APPENDIX A

PROCESSED METEOROLOGICAL DATA FOR THE 1957 FIRE

This appendix contains the processed meteorological data used in the 1957 fire simulation. Raw meteorological data for Rocky Flats (Table A-1) were obtained from the Phase I Task 6 report (ChemRisk 1994, Appendix F). No mention of the instrument height was provided; therefore, we assumed measurements were made at the 10-m level, which is the typical meteorological measurement height. Measurements were reported on 15-minute intervals and included wind speed and wind direction. Denver Stapleton International Airport data were obtained from the National Climatic Data Center in Ashville, North Carolina (Table A-2). These data included estimates wind speed, wind direction, cloud cover, ceiling height, and temperature recorded on an hourly basis. The Denver Stapleton data do not represent the average over the hour reported; rather, they are a single observation taken on the hour.

Hourly stability classes were calculated separately for the RFP and Denver Stapleton International Airport meteorological recording stations using the general classification scheme discussed in Pasquill (1961), Gifford (1961), and Turner (1964). This typing scheme employs seven stability categories ranging from A (extremely unstable) to G (extremely stable). Hourly average wind speed and direction also were calculated from the RFP meteorological data using the protocol described in U.S. Environmental Protection Agency (EPA) (1987).

One modification was performed to the data provided in ChemRisk (1994). For the first hour of the simulation (10:00 p.m.–11:00 p.m.), the wind speed was changed to the average of the last two 15-minute segments (10:30 and 10:45). We used meteorological conditions that reflected the last 30 minutes of the hour because that is when the bulk of the release is postulated to have occurred. This resulted in a change in the mean hourly average wind direction from 106 degrees to 52 degrees. The mean wind speed remained about 1 m s^{-1} regardless of the averaging period.

Table A-1. Processed Meteorological Data from the Rocky Flats Plant, September 11 and 12, 1957

Date	Time (Hour)	Wind speed (m s^{-1})	Wind direction (degrees)	Temperature (F)	Stability
September 11, 1957	22	1.0	52	53	6
	23	3.5	319	52	4
September 12, 1957	0	4.9	286	50	5
	1	3.1	285	49	5
	2	3.9	283	48	5
	3	5.7	273	48	5
	4	3.0	349	48	6
	5	2.4	136	47	6
	6	1.7	165	48	4
	7	2.0	334	51	3
	8	1.1	51	57	2
	9	1.8	33	62	2

Table A-2. Processed Meteorological Data from Denver Stapleton International Airport, September 11 and 12, 1957

Date	Time (Hour)	Wind speed ($m\ s^{-1}$)	Wind direction (degrees)	Temperature (F)	Stability	Cloud cover (tenths)	Ceiling height (feet)
September 11, 1957	22	5.7	200	53	4	3	18000
	23	5.7	200	52	4	3	18000
September 12, 1957	0	6.2	200	50	4	0	18000
	1	6.7	200	49	4	0	18000
	2	7.2	200	48	4	0	18000
	3	7.2	200	48	4	0	18000
	4	6.7	200	48	4	0	18000
	5	6.7	200	47	4	0	18000
	6	6.7	200	48	4	0	18000
	7	2.6	350	51	3	0	18000
	8	3.1	270	57	3	0	18000
	9	2.6	270	62	2	0	18000

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